

***Glyptothorax botius* (Hamilton, 1822), a valid species of catfish  
(Teleostei: Sisoridae) from northeast India,  
with notes on the identity of *G. telchitta* (Hamilton, 1822)**

HEOK HEE NG

Fish Division, Museum of Zoology, University of Michigan, 1109 Geddes Avenue, Ann Arbor, Michigan 48109-1079, USA (heokheen@umich.edu)

**Abstract**

*Glyptothorax botius* is revalidated from synonymy with *G. telchitta*. Both *G. botius* and *G. telchitta* are known from the Ganges River drainage in northeast India, and differ from congeners in the region in having a combination of large, prominent tubercles on the head and body, a thoracic adhesive apparatus without a median depression, and a very slender body and caudal peduncle. *Glyptothorax botius* was previously considered a synonym of *G. telchitta*, but differs from it in having a more rounded snout when viewed laterally, the presence (vs. absence) of dark saddles on the body, a thoracic adhesive apparatus with broader folds of skin, a longer adipose-fin base (12.0–16.4% SL vs. 9.5–11.5) and a more slender caudal peduncle (3.1–4.2% SL vs. 4.7–5.9). Both species are redescribed in this study, and neotypes are designated to fix their taxonomy.

**Key words:** Siluriformes, Ganges River, neotypes

**Introduction**

*Glyptothorax* Blyth, 1860 is a diverse (84 nominal species), widely distributed genus of sisorid catfish known from Asia Minor (in the Tigris and Euphrates River drainages) east- and southwards to the Yangtze River drainage and southeast Asia. Members of the genus are diagnosed in having a thoracic adhesive apparatus comprising an elliptical field of folded longitudinal pleats of skin, a detached distal portion of the premaxilla, and long and thin lateral arms of the vomer that extend under the entire length of the articular process of the lateral ethmoid (de Pinna, 1996). The genus is very diverse in the Indian subcontinent (29 of the 84 nominal species are known from there), although the taxonomy of Indian *Glyptothorax* is poorly understood.

During recent ichthyological surveys of northeast India, two species of *Glyptothorax* were obtained from the Ganges River drainage. One of the species was referable to *G. telchitta* (Hamilton, 1822), but the second morphologically similar species was not readily identifiable. Further investigation revealed that the second species is referable to *G. botius* (Hamilton, 1822), and that the identities of the two species have been confused for some time. The objective of this study is to clarify the identities of these two species and to redescribe them. Neotypes are also designated for *Pimelodus telchitta* Hamilton, 1822 and *Pimelodus botius* Hamilton, 1822 to fix the taxonomy of these species.

### Material and Methods

Measurements were made point to point with dial calipers and data recorded to a tenth of a millimeter. Counts and measurements were made on the left side of specimens whenever possible, following Ng & Lim (1995), except for the following: head length was measured from the tip of the snout to the posterior-most extremity of the fleshy opercular flap, and vertebral counts, which are expressed as abdominal + postabdominal vertebrae (where postabdominal vertebrae are those with closed hemal arches). The following measurements of Ng & Lim (1995) were not taken: thoracic length along median line and postpelvic length, and the following additional measurements were utilized: preanal, prepelvic and prepectoral lengths are measured from the tip of the snout to the anterior basis of the dorsal, anal, pelvic and pectoral fins respectively; length of adipose-fin base is measured from the anterior-most point of origin to the posterior-most point of the adipose fin base; dorsal to adipose distance is measured from the base of the last dorsal-fin ray to the anterior-most point of origin of the adipose fin base; post-adipose distance is measured from the posterior-most point of the adipose fin base to the tip of the hypural complex; head depth is measured at the base of the supraoccipital spine. Measurements of features of the head are presented as proportions of head length (HL); head length and measurements of body parts are given as proportions of standard length (SL). Fin rays were counted under a binocular dissecting microscope using transmitted light and vertebral counts were taken from radiographs. Numbers in parentheses following meristic data indicate the number of specimens with that count. Drawings of the specimens were made with a Wild M5 microscope and camera lucida. Institutional codes follow Eschmeyer (1998).

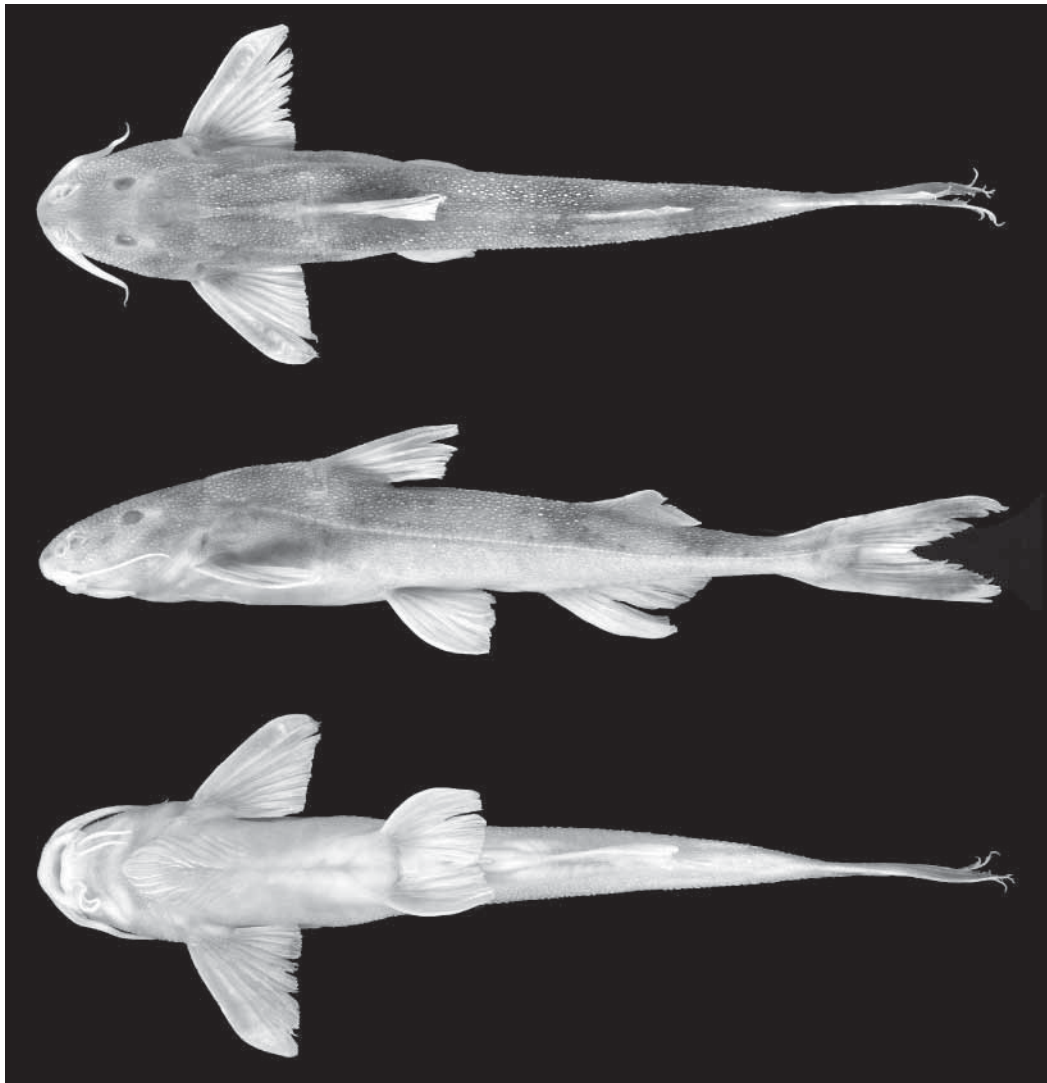
### *Glyptothorax botius* (Hamilton, 1822) (Figs. 1 & 8)

*Pimelodus botius* Hamilton, 1822: 192 (type locality: Pargong, fluviis Kamrupa borealis).

*Glyptosternum telchitta* (non Hamilton) Day, 1877: 498, Pl. CXVI Figs. 2 & 2a; 1889: 199.

*Glyptothorax telchitta* (non Hamilton) Hora, 1923: 28; (?) Shaw & Shebbeare, 1938: 103, Fig. 105; Hora & Menon, 1949: 57 (in part); Menon, 1954: 42 (in part).

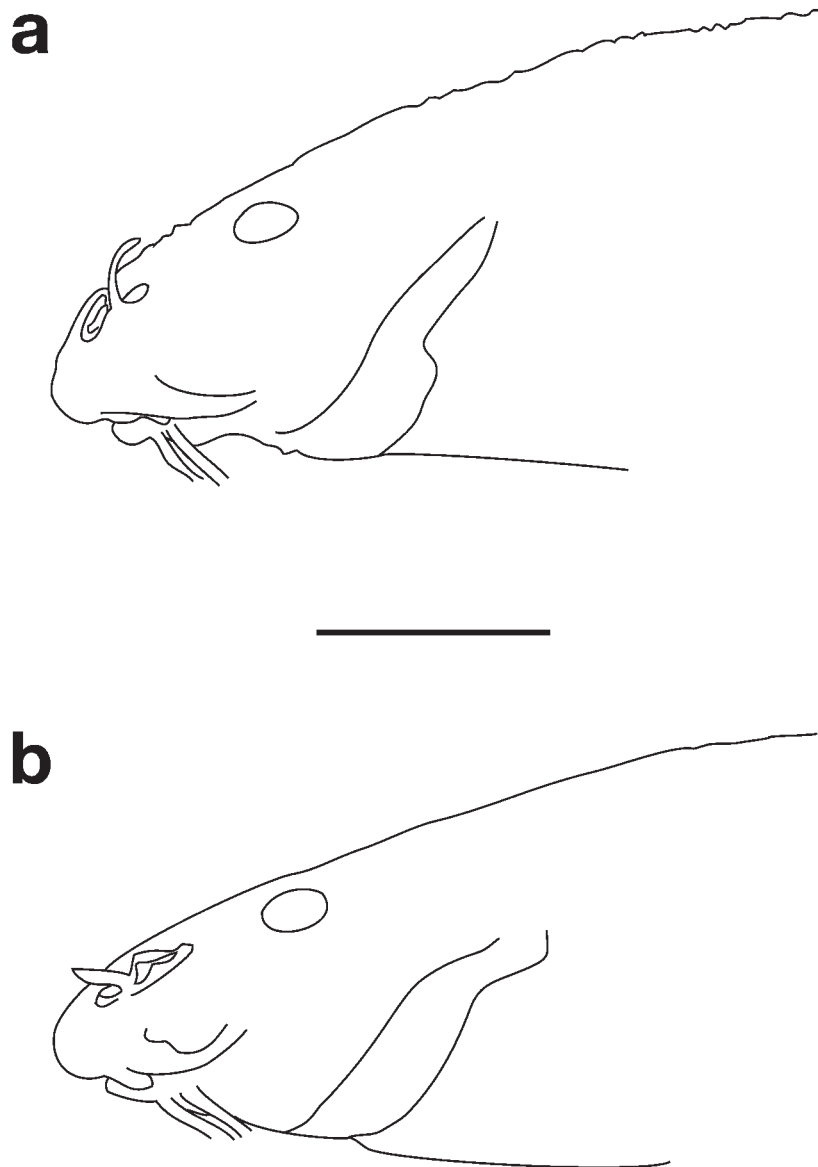
**Material examined.** ZRC 50223, neotype (herein designated), 74.6 mm SL; ZRC 49129 (29), 25.6–71.0 mm SL; UMMZ 244940 (2), 27.6–28.5 mm SL; India: west Bengal: Hooghly River at Kalna, 23°13'30.0"N 88°22'39.0"E.



**FIGURE 1.** *Glyptothorax botius*, neotype, ZRC 50223, 74.6 mm SL; dorsal, lateral and ventral views.

**Diagnosis.** *Glyptothorax botius* and *G. telchitta* can be distinguished from congeners in northeast India in having a combination of large, prominent tubercles on the head and body, a thoracic adhesive apparatus without a median depression, and a very slender body and caudal peduncle (sometimes described as “spindle shaped”). *Glyptothorax botius* dif-

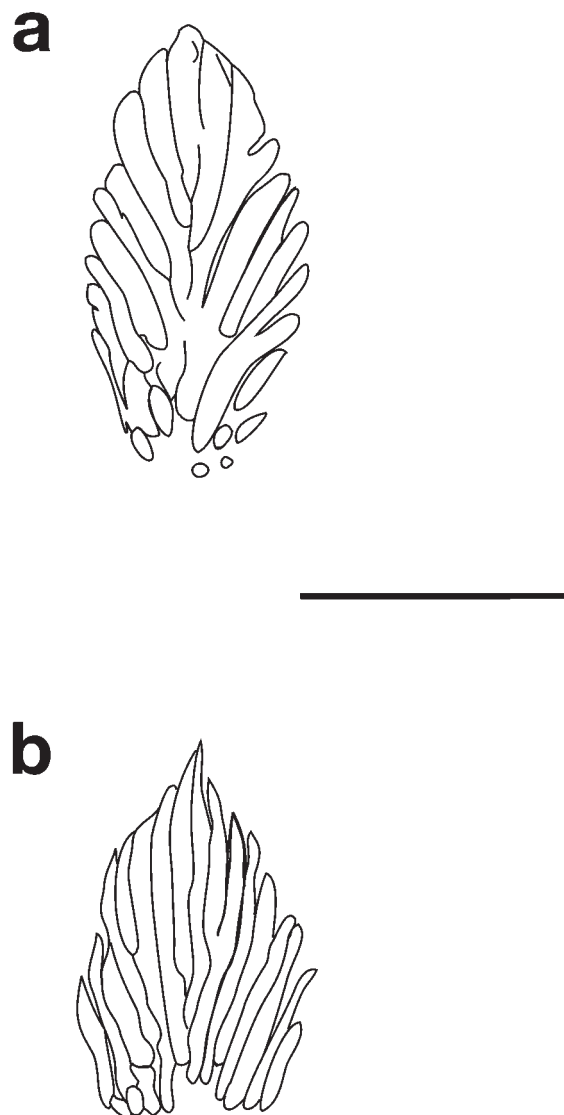
fers from *G. telchitta* in having a more rounded snout when viewed laterally (Fig. 2), the presence (vs. absence) of dark saddles on the body, a thoracic adhesive apparatus with broader folds of skin (Fig. 3), a longer adipose-fin base (12.0–16.4% SL vs. 9.5–11.5) and a more slender caudal peduncle (3.1–4.2% SL vs. 4.7–5.9).



**FIGURE 2.** Lateral views of heads of: a. *Glyptothorax botius* (ZRC 49129, 46.1 mm SL); b. *G. telchitta* (UMMZ 244944, 47.7 mm SL). Scale bar indicates 5 mm.

**Description.** Morphometric data in Table 1. Head depressed, body moderately compressed. Dorsal profile rising evenly from tip of snout to origin of dorsal fin, then sloping

gently ventrally from there to end of caudal peduncle. Ventral profile flat to anal-fin base, then sloping gently dorsally from there to end of caudal peduncle. Caudal peduncle long and very slender. Anus and urogenital openings located at vertical through middle of adpressed pelvic fin. Skin prominently tuberculate, with ovoid tubercles particularly visible on sides of body. Lateral line complete and midlateral, delineated by series of closely spaced, conical tubercles. Vertebrae 13+21 (4), 14+20 (5), 15+19 (1), 14+21 (13), 14+22 (1), 15+20 (6) or 15+21 (2).



**FIGURE 3.** Thoracic adhesive apparatuses of: a. *Glyptothorax botius*, (ZRC 49129, 46.1 mm SL); b. *G. telchitta* (UMMZ 244944, 47.7 mm SL). Scale bar indicates 5 mm.

**TABLE 1.** Biometric data for *Glyptothorax botius* (n=32)

	Neotype	Range	Mean±SD
<b>%SL</b>			
Predorsal length	35.4	34.9–38.6	37.0±1.31
Preanal length	63.3	61.0–63.9	62.7±1.00
Prepelvic length	42.9	42.5–46.8	44.5±1.40
Prepectoral length	20.6	19.8–22.0	21.0±0.79
Length of dorsal-fin base	11	10.9–13.0	11.7±0.66
Dorsal-spine length	13.7	12.1–14.5	13.2±0.86
Length of anal-fin base	16.4	16.2–18.5	17.2±0.67
Pelvic-fin length	14.3	13.3–15.8	14.3±0.74
Pectoral-fin length	20.6	18.2–21.9	20.0±1.29
Pectoral-spine length	15.3	13.6–16.4	15.1±0.89
Caudal-fin length	21.6	20.3–24.9	23.0±1.44
Length of adipose-fin base	16	12.0–16.4	14.4±1.16
Dorsal-to-adipose distance	24.3	21.2–24.3	22.9±0.92
Post-adipose distance	17.7	17.7–21.6	19.3±1.14
Length of caudal peduncle	20.2	18.3–21.7	20.0±0.95
Depth of caudal peduncle	4.2	3.1–4.2	3.6±0.20
Body depth at anus	10.9	10.6–12.3	11.4±0.57
Head length	22.3	22.0–24.2	23.2±0.66
Head width	15.4	14.8–17.1	15.7±0.65
Head depth	13.5	13.1–15.7	14.0±0.70
<b>%HL</b>			
Snout length	56.6	50.3–58.0	53.7±2.48
Interorbital distance	25.3	23.3–26.9	25.0±1.24
Eye diameter	12	10.4–12.4	11.7±0.65
Nasal barbel length	14.5	14.5–19.9	16.9±1.63
Maxillary barbel length	71.7	66.7–79.1	73.2±3.76
Inner mandibular barbel length	28.9	28.9–38.7	31.3±2.90
Outer mandibular barbel length	45.2	36.4–50.4	43.3±4.27

Head depressed and narrow, with rounded snout margin when viewed laterally (Fig. 2a). Snout prominent. Anterior and posterior nares large and separated only by base of nasal barbel. Gill openings broad, extending from immediately ventral to posttemporal to

isthmus. Bony elements of dorsal surface of head covered with thick, tuberculate skin. Eye ovoid, horizontal axis longest; located entirely in dorsal half of head. Orbit with free margin.

Barbels in four pairs. Maxillary barbel long and slender, extending almost to base of pectoral spine. Nasal barbel slender, extending to one-third of distance between its base and anterior orbital margin. Inner mandibular-barbel origin close to midline, extending to midway between its base and that of pectoral spine. Outer mandibular barbel originates posterolateral of inner mandibular barbel, extending to two-thirds of distance between its base and that of pectoral spine.

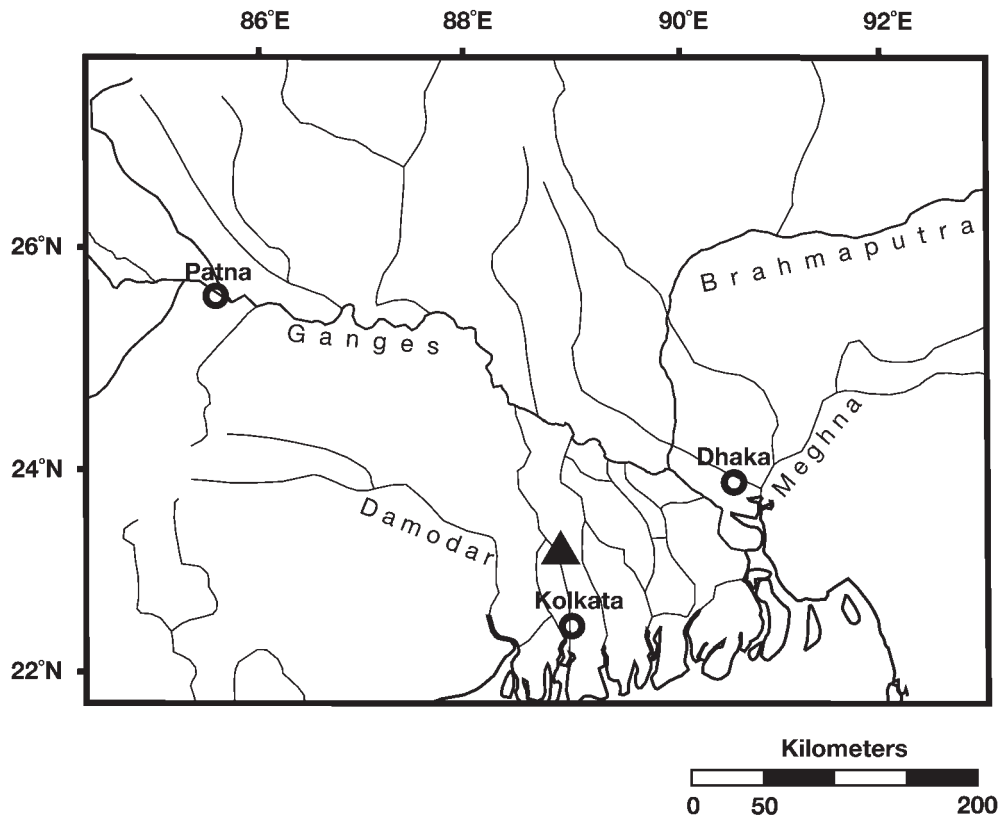
Mouth inferior, premaxillary tooth band not exposed when mouth is closed. Oral teeth small and villiform, in irregular rows on all tooth-bearing surfaces. Premaxillary teeth in single broad semilunate band. Dentary teeth in two narrow crescentic bands separated at midline.

Dorsal fin located above anterior two-fifths of body, with I,5 (2), I,5,i (4) or I,6 (26) rays; posterior fin margin straight or slightly concave; spine moderately long, slender and gently curved, without serrations on anterior or posterior edges. Adipose fin with anterior margin slightly concave and posterior margin angular. Caudal fin strongly forked, with i,6,5,i (1), i,7,7,i (9), i,7,8,i (11) or i,8,7,i (11) principal rays, and subequal upper and lower lobes; lower lobe slightly longer and broader than upper lobe. Procurent rays symmetrical and extending only slightly anterior to fin base. Anal-fin base slightly anterior to adipose-fin origin. Anal fin with straight anterior margin and slightly concave posterior margin; with iv,8 (1), iv,9 (12), iv,9,i (4), iii,10 (3) or iv,10 (12) rays. Pelvic-fin origin immediately posterior to vertical through posterior end of dorsal-fin base. Pelvic fin with slightly convex margin and i,5 (32) rays; tip of adpressed fin not reaching anal-fin origin. Pectoral fin with I,8 (5), I,8,i (21), I,9 (5) or I,9,i (1) rays; posterior fin margin slightly concave; anterior spine margin smooth, posterior margin with 5–12 serrations. Thoracic adhesive apparatus present, located on belly and consisting of broad longitudinal pleats of skin in narrow elliptical field. Adhesive apparatus without median depression and extending from just behind gill opening to immediately posterior to base of last pectoral-fin ray.

**Coloration.** In 70% ethanol: Dorsal and lateral surfaces of head, and dorsal surface of body very pale brown, fading to a lighter color ventrally. Occipital and opercular region with large darker brown patches. Ventral surface of head and belly yellowish. A series of narrow darker brown saddles along dorsal surfaces of body; saddles extending only to lateral line: 1) immediately posterior to base of last dorsal-fin ray; 2) immediately in front of and below anterior quarter of adipose-fin base; and 3) anterior half of caudal peduncle, immediately posterior to adipose-fin base. Faint darker brown spot at base of caudal peduncle. Dorsal-fin rays with evenly-distributed brown chromatophores along middle third of fin rays, imparting appearance of faint band across fin; all other parts of dorsal fin hyaline. Pectoral, pelvic and anal fins hyaline. Pectoral spine with slightly darker coloration on dorsal surface throughout most of its length. Adipose fin light very pale brown,

with hyaline distal margin. Caudal fin hyaline, with brown chromatophores on median fin rays of each caudal lobe, imparting appearance of a broad brown band along each lobe. Other parts of caudal fin hyaline. Barbels yellowish.

**Distribution.** Known from the Ganges River drainage. Only material from the Hooghly River was examined for this study (Fig. 4).



**FIGURE 4.** Distribution (based only on examined material) of both *G. botius* and *G. telchitta* (triangle).

***Glyptothorax telchitta* (Hamilton, 1822) (Figs. 5–7)**

*Pimelodus telchitta* Hamilton, 1822: 185 (type locality: Jungipur, Nathpur).

*Glyptosternum botia* (non Hamilton) Day, 1877: 497, Pl. CXIII Figs. 4 & 4a.

*Glyptosternum botium* (non Hamilton) Day, 1889: 198.

*Glyptothorax botia* (non Hamilton) Hora, 1923: 27.

*Glyptothorax* sp. Hora, 1923: 26, Pl. IV Fig. 2.

*Glyptothorax telchitta* Hora & Menon, 1949: 57, Pl. II Figs. 1–3 (in part); Menon, 1954: 42 (in part); Misra, 1976: 281, Pl. XII Figs. 2–4; Jayaram & Singh, 1977: 267; Jayaram, 1979: 47.





**FIGURE 5.** *Glyptothorax telchitta*, neotype, UMMZ 244946, 69.2 mm SL; dorsal, lateral and ventral views.

**Material examined.** UMMZ 244946, neotype (herein designated), 69.2 mm SL; UMMZ 244944 (13), 36.5–63.8 mm SL; ZRC 49130 (2), 35.4–44.3 mm SL; India: West Bengal, Hooghly River at Kalna, 23°13'30.0"N 88°22'39.0"E. UMMZ 244951 (2), 58.7–79.0 mm SL; India: West Bengal, Hooghly River at Ranaghat. ZRC 49128 (7), 43.5–56.5 mm SL; India: West Bengal, Simurali.

**Diagnosis.** *Glyptothorax botius* and *G. telchitta* can be distinguished from congeners in northeast India in having a combination of large, prominent tubercles on the head and body, a thoracic adhesive apparatus without a median depression, and a very slender body and caudal peduncle (sometimes described as “spindle shaped”). *Glyptothorax botius* differs from *G. telchitta* in having a more triangular snout when viewed laterally (Fig. 2), the absence (vs. presence) of dark saddles on the body, a thoracic adhesive apparatus with narrower folds of skin (Fig. 3), a shorter adipose-fin base (9.5–11.5% SL vs. 12.0–16.4) and a deeper caudal peduncle (4.7–5.9% SL vs. 3.1–4.2).

**Description.** Morphometric data in Table 2. Head depressed, body moderately compressed. Dorsal profile rising evenly from tip of snout to origin of dorsal fin, then sloping gently ventrally from there to end of caudal peduncle. Ventral profile flat to anal-fin base, then sloping gently dorsally from there to end of caudal peduncle. Caudal peduncle long and moderately slender. Anus and urogenital openings located at vertical through middle of adpressed pelvic fin. Skin prominently tuberculate, with ovoid tubercles particularly visible on sides of body. Lateral line complete and midlateral, delineated by series of closely spaced, conical tubercles. Vertebrae 13+21 (1), 14+20 (2), 15+19 (1), 13+22 (1), 14+21 (13), 14+22 (6) or 15+20 (1)

Head depressed and narrow, with triangular snout margin when viewed laterally (Fig. 2b). Snout prominent. Anterior and posterior nares large and separated only by base of nasal barbel. Gill openings broad, extending from immediately ventral to posttemporal to isthmus. Bony elements of dorsal surface of head covered with thick, tuberculate skin. Eye ovoid, horizontal axis longest; located entirely in dorsal half of head. Orbit with free margin.

Barbels in four pairs. Maxillary barbel long and slender, extending almost to base of pectoral spine. Nasal barbel slender, extending to one-third of distance between its base and anterior orbital margin. Inner mandibular-barbel origin close to midline, extending to midway between its base and that of pectoral spine. Outer mandibular barbel originates posterolateral of inner mandibular barbel, extending to two-thirds of distance between its base and that of pectoral spine.

Mouth inferior, premaxillary tooth band almost wholly exposed when mouth is closed. Oral teeth small and villiform, in irregular rows on all tooth-bearing surfaces. Premaxillary teeth in single broad semilunate band. Dentary teeth in two narrow crescentic bands separated at midline.

**TABLE 2.** Biometric data for *Glyptothorax telchitta* (n=25)

	Neotype	Range	Mean±SD
<b>%SL</b>			
Predorsal length	34.0	34.0–36.6	35.6±0.85
Preanal length	62.9	61.5–64.2	62.7±0.90
Prepelvic length	43.8	43.8–46.9	45.1±1.20
Prepectoral length	18.8	18.8–21.8	20.3±0.92
Length of dorsal-fin base	12.3	9.4–13.7	11.8±1.01
Dorsal-spine length	12.6	11.8–14.7	13.5±1.04
Length of anal-fin base	15.0	14.5–18.3	16.9±1.38
Pelvic-fin length	13.2	11.4–15.2	13.6±0.95
Pectoral-fin length	17.1	17.1–20.4	18.4±1.02
Pectoral-spine length	13.9	12.3–17.0	15.1±1.32
Caudal-fin length	25.3	22.4–30.5	25.4±2.22
Length of adipose-fin base	9.5	9.5–11.5	10.6±0.51
Dorsal-to-adipose distance	25.0	20.2–25.9	23.5±1.38
Post-adipose distance	21.1	20.0–22.7	21.3±0.84
Length of caudal peduncle	20.7	19.2–23.8	21.0±1.28
Depth of caudal peduncle	5.5	4.7–5.9	5.5±0.20
Body depth at anus	11.8	9.9–13.3	11.4±1.24
Head length	22.4	22.1–25.7	24.2±1.16
Head width	15.6	14.5–16.8	15.6±0.71
Head depth	11.7	11.0–13.8	12.5±0.92
<b>%HL</b>			
Snout length	48.4	48.4–53.2	50.7±1.66
Interorbital distance	26.5	24.6–30.0	26.3±1.47
Eye diameter	9.7	8.5–10.8	9.6±0.69
Nasal barbel length	18.1	12.3–20.5	17.2±2.32
Maxillary barbel length	49.7	49.7–66.2	58.5±5.09
Inner mandibular barbel length	29.0	23.5–32.3	27.5±2.75
Outer mandibular barbel length	35.5	34.6–41.1	37.3±1.86

Dorsal fin located above anterior two fifths of body, with I,5,i (21) or I,6 (4) rays; posterior fin margin straight or slightly concave; spine moderately long, slender and gently curved, without serrations on anterior or posterior edges. Adipose fin with anterior margin

slightly concave and posterior margin angular. Caudal fin strongly forked, with i,7,7,i (1), i,7,8,i (17) or i,8,7,i (7) principal rays, and subequal upper and lower lobes; lower lobe slightly longer and broader than upper lobe. Procurent rays symmetrical and extending only slightly anterior to fin base. Anal-fin base slightly anterior to adipose-fin origin. Anal fin with straight anterior margin and slightly concave posterior margin; with iv,8 (1), iv,9 (11), iv,9,i (3), iv,10 (9) or iv,11,i (1) rays. Pelvic-fin origin immediately posterior to vertical through posterior end of dorsal-fin base. Pelvic fin with slightly convex margin and i,5 (25) rays; tip of adpressed fin not reaching anal-fin origin. Pectoral fin with I,7,i (5), I,8 (6) or I,8,i (14) rays; posterior fin margin slightly concave; anterior spine margin smooth, posterior margin with 8–10 serrations. Thoracic adhesive apparatus present, located on belly and consisting of narrow longitudinal pleats of skin in elliptical field. Adhesive apparatus without median depression and extending from just behind gill opening to immediately posterior to base of last pectoral-fin ray.

**Coloration.** In 70% ethanol: Dorsal and lateral surfaces of head, and dorsal surface of body brown to brownish gray, fading to a lighter color ventrally. A paler but distinct stripe running laterally along dorsal second quarter of body (immediately above lateral line). Body with small dark brown spots randomly and sparsely scattered throughout body in some individuals. Ventral surface of head and belly yellowish. Dorsal-fin base brown to brownish gray; dorsal-fin rays with evenly-distributed brown chromatophores along middle third of fin rays, imparting appearance of irregular band across fin; all other parts of dorsal fin hyaline. Pectoral, pelvic and anal fins hyaline. Pectoral spine with slightly darker coloration on dorsal surface throughout most of its length. Adipose fin brown to brownish gray, with hyaline distal margin. Caudal fin hyaline, with dark brown chromatophores on median fin rays of each caudal lobe, imparting appearance of a broad dark brown band along each lobe. Brown bands coalescent with dark brown spot at base of caudal peduncle. Other parts of caudal fin hyaline. Barbels brown to brownish gray dorsally, yellowish ventrally.

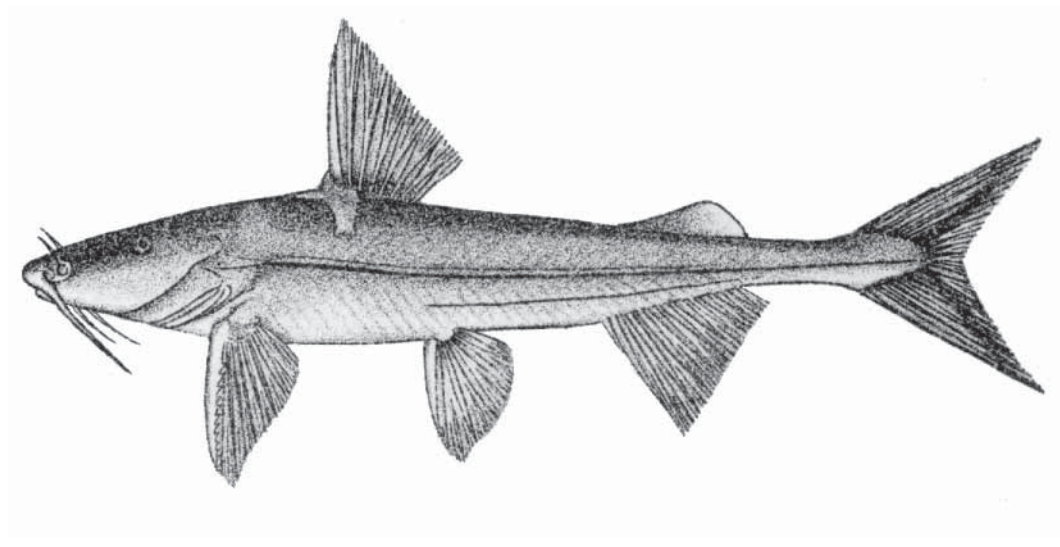
**Distribution.** Known from the Ganges River drainage. Only material from the Hooghly River was examined for this study (Fig. 4).

## Discussion

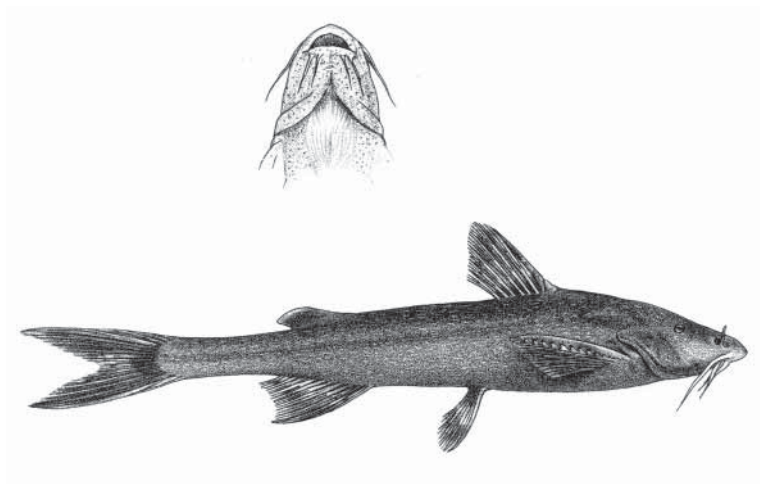
Hamilton (1822) described *Glyptothorax botius* from “Pargong, fluviis Kamrupa borealis” (=Patgaon in Assam) and *G. telchitta* from Jungipur (in West Bengal) and Nathpur (in Uttar Pradesh). Subsequent workers (e.g. Day, 1877) had considered the two species distinct, until Hora & Menon (1949) synonymized them (retaining *G. telchitta* as the valid name). Since then, this convention has been followed and *G. telchitta* is generally acknowledged as the name for the slender-bodied *Glyptothorax* species from northeast India (e.g. Talwar & Jhingran, 1991); *G. telchitta* is considered distinct enough that it is never confused with any other Indian *Glyptothorax*. During recent ichthyological surveys

of northeast India, I encountered two clearly distinct species of slender-bodied *Glyptothorax* that were found syntopically in the Ganges River drainage in West Bengal. One species had a deeper caudal peduncle, shorter adipose-fin base, a more triangular snout, and more uniform coloration without any distinct saddles; this was referable to *G. telchitta* as currently understood. The second species had a more slender caudal peduncle, longer adipose-fin base, a more rounded snout, and a series of dark saddles on the dorsal surfaces of the body. The identity of this species was not immediately obvious. It then became necessary to reinvestigate the validity of *G. botius* (as the only nominal species considered a synonym of *G. telchitta*).

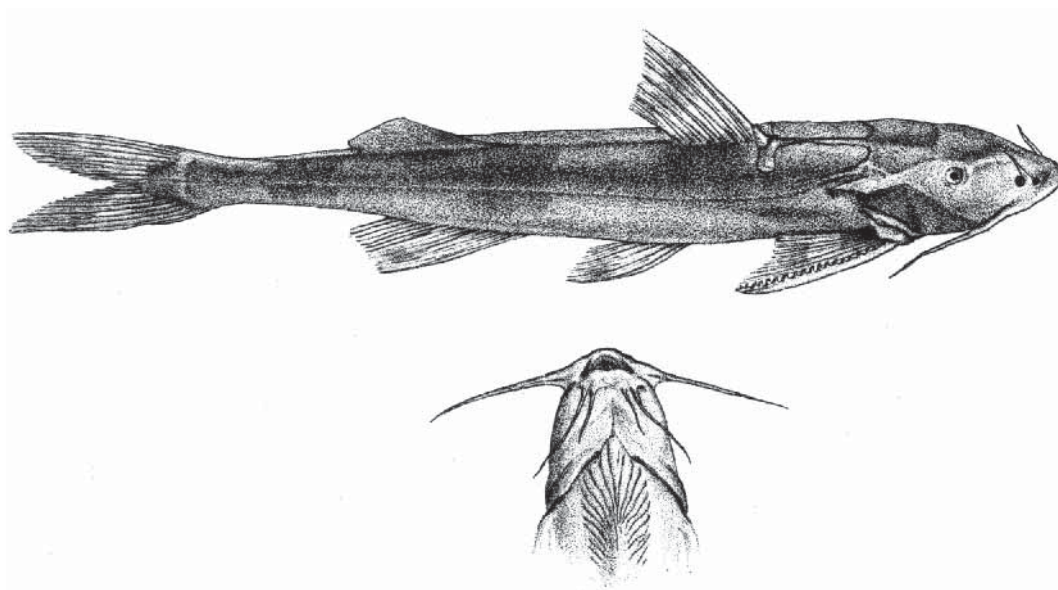
The original descriptions of *G. telchitta* and *G. botius* are not very informative. A comparison of the descriptions reveals that no significant difference could be found in morphology and coloration; this led Hora & Menon (1949) to consider the two species synonyms. Comparison with the figure prepared for the original description of *G. telchitta* (published as Pl. 21 Fig. 3 in Hora, 1929; Fig. 6) indicates that *G. telchitta* is the species with a deeper caudal peduncle, shorter adipose-fin base, a more triangular snout, and more uniform coloration without any distinct saddles. Day (1877) considered *G. botius* to be distinct from *G. telchitta*, and illustrated both species. His illustration of *G. botius* (Pl. CXIII Figs. 4 & 4a; Fig 7) matches that of *G. telchitta*, and his illustration of *G. telchitta* (Pl. CXVI Figs. 2 & 2a; Fig 8), matches that of the species with a more slender caudal peduncle, longer adipose-fin base, a more rounded snout, and a series of dark saddles on the dorsal surfaces of the body, even showing the broader folds of the skin on the thoracic adhesive apparatus.



**FIGURE 6.** *Glyptothorax telchitta*, illustration from Hamilton, 1822 (Pl. 11 Fig. 56).



**FIGURE 7.** *Glyptothorax telchitta*, illustrations from Day, 1877 (Pl. CXIII Figs. 4 & 4a).



**FIGURE 8.** *Glyptothorax botius*, illustrations from Day, 1877 (Pl. CXVI Figs. 2 & 2a).

Therefore, there is some confusion regarding the identity of *G. botius*. No illustration was prepared for the original description (Hora, 1929), nor is any mention made of the distinctive color pattern (the presence of dark saddles) in the original description (the color pattern is merely described as “...lurid brown, with a little yellowness intermixed...”). In fact, the description is sufficiently ambiguous that it could refer to any of the *Glyptothorax*



species occurring in northeast India, although the statement that it is “...long in proportion to its breadth...” (this statement was also used in the description of *G. telchitta* but not in *G. cavia*, the only other *Glyptothorax* described by Hamilton) suggests that it is similar in overall morphology to *G. telchitta*. This confusion is heightened by the misidentification of *G. telchitta* as *G. botius* and vice versa by Day (1877), as explained above. The limited evidence available suggests that *G. botius* is the oldest (and only) available name for the *Glyptothorax* with a more slender caudal peduncle, longer adipose-fin base, a more rounded snout, and a series of dark saddles on the dorsal surfaces of the body, and the name is herein defined as such.

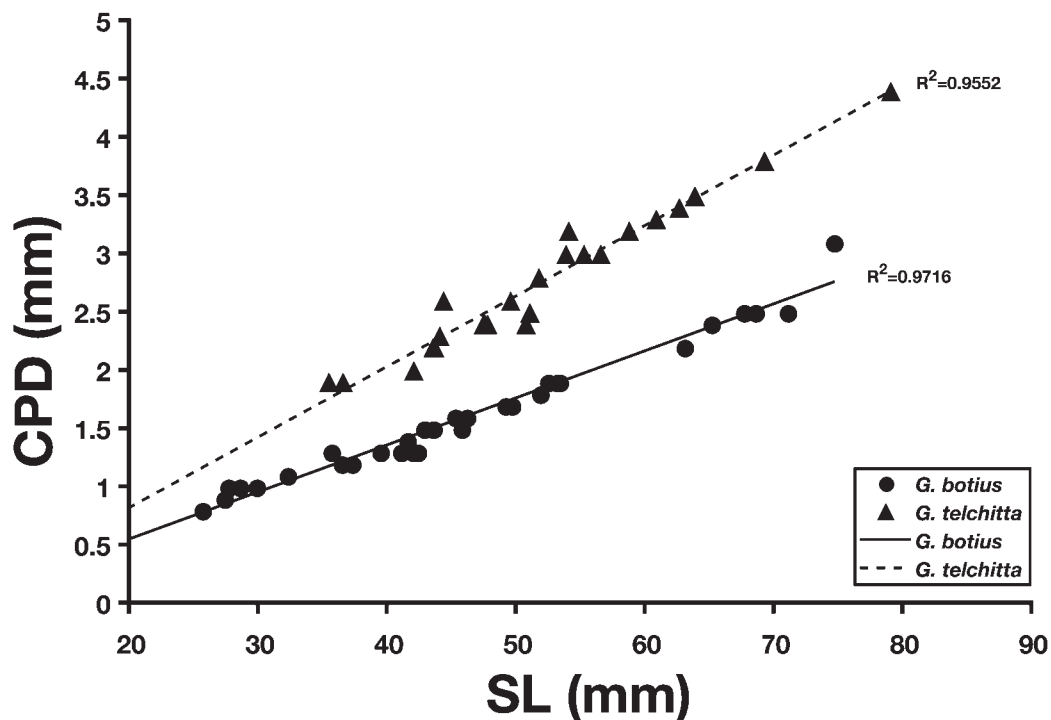
Given the confusion surrounding the identity of *G. botius* and the fact that type material does not exist for any of the Hamilton species as he did not retain any specimens used for his descriptions (Gudger, 1924; Hora, 1929), it is necessary to designate neotypes for *Pimelodus botius* and *P. telchitta*, and in accordance with the conditions stipulated in Article 75 of the International Code of Zoological Nomenclature, ZRC 50223, a specimen 74.6 mm SL collected from the Hooghly River at Kalna, West Bengal, India by H. H. Ng & D. C. J. Yeo on 24 January 1999 is hereby designated the neotype of *Pimelodus botius* Hamilton, 1822, and UMMZ 244946, a specimen 69.2 mm SL collected from the Hooghly River at Kalna, West Bengal, India by H. H. Ng et al. on 20 April 2004 is hereby designated the neotype of *Pimelodus telchitta* Hamilton, 1822. It is possible that *G. botius* sensu Hamilton may not be conspecific with the definition of the species used here, but the only alternative would be to make *G. telchitta* and *G. botius* objective synonyms by designating a common neotype and describing the species defined as *G. botius* here as new. However, the naming of another *Glyptothorax* species does nothing to resolve the confused taxonomy of the Indian *Glyptothorax*; it is felt that stability in nomenclature can be best served by the course of action here.

As a result of the confused taxonomy of the Indian *Glyptothorax*, the exact number of valid *Glyptothorax* species occurring in the Ganges River drainage cannot be ascertained. Besides *G. botius* and *G. telchitta*, 12 other nominal species have been described from the Ganges River drainage: *G. cavia* (Hamilton, 1822), *G. pectinopterus* (M'Clelland, 1842), *G. gracilis* (Günther, 1864), *G. conirostre* (Steindachner, 1867), *G. stolickeae* (Steindachner, 1867), *G. modestum* (Day, 1872), *G. lineatum* (Day, 1877), *G. brevipinnis* Hora, 1923, *G. alaknandi* Tilak, 1969, *G. garhwali* Tilak, 1969, *G. dakpathari* Tilak & Husain, 1976, and *G. indicus* Talwar in Talwar & Jhingran, 1991. I tentatively consider only seven of these to be valid: *G. brevipinnis* (with *G. alaknandi* as a junior synonym), *G. cavia* (with *G. lineatum* as a junior synonym), *G. conirostre*, *G. garhwali*, *G. gracilis* (with *G. dakpathari*, *G. modestum* and *G. stolickeae* as junior synonyms), *G. indicus*, and *G. pectinopterus*. Besides the characters mentioned in the diagnosis, both *G. botius* and *G. telchitta* can be distinguished from *G. brevipinnis* and *G. pectinopterus* in having a longer thoracic adhesive apparatus (reaching immediately posterior to base of last pectoral-fin ray vs. to middle of pectoral-fin base), from *G. cavia* in having a shorter head (22.0–25.7% SL vs. 27.6–29.9),

and from *G. garhwali* in having a narrower head (14.5–17.1% SL vs. 18.0–19.9). Both *G. botius* and *G. telchitta* further differ from both *G. conirostre* and *G. gracilis* in having a smooth (vs. serrated) posterior edge of the dorsal spine, and from *G. indicus* in having a shorter head (22.0–25.7% SL vs. 27.3–29.1) and the thoracic adhesive apparatus extending (vs. not extending) to the gular region.

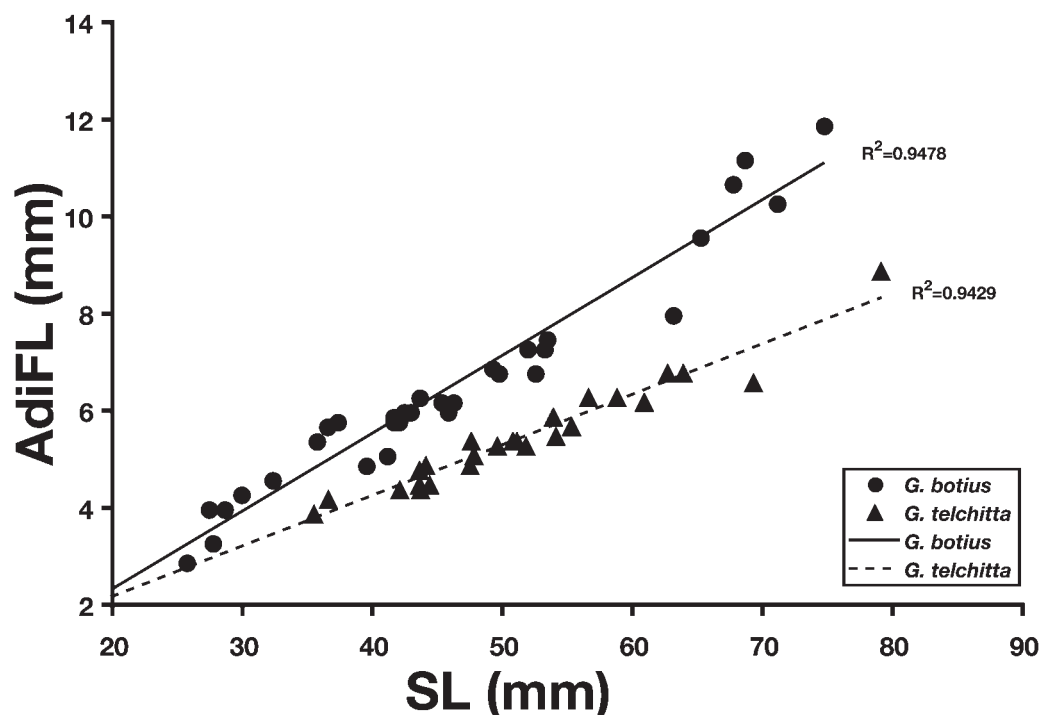
*Glyptothorax botius* and *G. telchitta* occur syntopically in the Ganges River drainage. Both species were collected from the bottom of a large, fairly swift river (Hooghly River) with a mixed sand/mud bottom, along with the many other sisorids (*Bagarius yarrelli*, *Gagata cenia*, *G. sexualis*, *Nangra assamensis*, *N. nangra*, *Gogangra viridescens* and *Sisor rabdophorus*).

The differences in biometrics between *G. botius* and *G. telchitta* are not solely due to ontogeny. The biplots of caudal peduncle depth (Fig. 9) and length of the adipose-fin base (Fig. 10) against SL show that the regression lines are significantly different (ANCOVA;  $P < 0.00000005$ ).



**FIGURE 9.** Scatterplot of depth of caudal peduncle (CPD) plotted against standard length for *Glyptothorax botius* and *G. telchitta*.





**FIGURE 10.** Scatterplot of length of adipose-fin base (AdiFL) plotted against standard length for *Glyptothorax botius* and *G. telchitta*.

### Comparative material

*Glyptothorax brevipinnis*: ZSI F10134/1, 4 syntypes, 45.2–80.2 mm SL; India. KU 28653 (6), 28.2–69.8 mm SL; Nepal: Kanchanpur, Brahamadev, Mahakali River at Brahamadev, 29°4'54.0"N 80°8'30.0"E. ZSI F6154/2 (1) 56.3 mm SL; India: Uttar Pradesh, Pauri Garhwal district, Alaknanda River near Srinagar [holotype of *Glyptothorax brevipinnis alaknandi*].

*Glyptothorax cavia*: OSUS 16337 (5), 73.0–131.0 mm SL; Nepal: Chitawan, Narayani River at Narayangarh, upstream from irrigation office. OSUS 16539 (5), 95.4–175.2 mm SL; Nepal: Nawalparasi, Narayani River at Tribeni Ghat.

*Glyptothorax conirostre*: Data from Steindachner (1867).

*Glyptothorax garhwali*: ZSI F6152/2, holotype, 86.6 mm SL; India: Uttar Pradesh, Pauri Garhwal district, Alaknanda River. ZSI F6153/2, paratype, 93.4 mm SL; India: Uttar Pradesh, Nainital district, Sarada River at Tanakpur.

*Glyptothorax gracilis*: KU 28747 (1), 100.6 mm SL; KU 29425 (2), 61.5–71.1 mm SL; Nepal: Bardiya/Kailali, Karnali River, purchased at Chisapani, 28°38'30.0"N 81°16'54.0"E. KU 29001 (1), 117.9 mm SL; Nepal: Palpa/Syangja, Nimaa, Kali Gandaki River at Nimaa, 27°55'12.0"N 83°40'48.0"E. KU 29400 (1), 95.1 mm SL; Nepal: Bardiya, Thakurdwara, Jharniya River, just E of Royal Bardiya Park headquarters, 28°27'6.0"N 81°14'42.0"E. KU 29518 (1), 91.4 mm SL; Nepal: Sankhuwasaba/Bhojpur, Tumlingtar, Arun River at Manakaamana, 1 hour's walk upstream from Tumlingtar, 27°20'24.0"N 87°11'18.0"E.

*Glyptothorax indicus*: ZSI F11376/1, holotype, 88.0 mm SL; India: streams of Terai, north Bengal. OSUS 16538 (12), 58.5–133.7 mm SL; Nepal: Nawalparasi, Narayani River at Tribeni Ghat.

*Glyptothorax pectinopterus*: NRM 30132 (27), 39.4–64.5 mm SL; India: Jhelum River, left bank, ca. 1 km downstream of Gingal, 34°7'34.0"N 74°5'36.0"E.

### Acknowledgments

I thank Andrew Bentley (KU), Anthony Echelle (OSUS), Sven Kullander (NRM), Douglas Nelson (UMMZ), Kelvin Lim (ZRC) and A. K. Karmakar (ZSI) for permission to examine material under their care, and Andrew Arunava Rao for facilitating fieldwork in India. Fieldwork in India was funded by the All Catfish Species Inventory (NSF DEB-0315963). The Carl L. and Laura C. Hubbs Research Fellowship from the Museum of Zoology, University of Michigan has provided additional support for this project.

### References

- Day, F. (1877) *The fishes of India: being a natural history of the fishes known to inhabit the seas and freshwaters of India, Burma and Ceylon. Part iii.* William Dawson & Sons, London, pp. 369–552.
- Day, F. (1889) *The fauna of British India, including Ceylon and Burma. Fishes. Vol. 1.* Taylor & Francis, London, 548 pp.
- de Pinna, M.C.C. (1996) A phylogenetic analysis of the Asian catfish families Sisoridae, Akysidae, and Amblycipitidae, with a hypothesis on the relationships of the neotropical Aspredinidae (Teleostei, Ostariophysi). *Fieldiana: Zoology (New Series)*, 84, 1–83.
- Eschmeyer, W. (1998) *Catalog of fishes.* California Academy of Sciences, San Francisco, 2905 pp.
- Gudger, E.W. (1924) The sources of the material for Hamilton-Buchanan's fishes of the Ganges, the fate of his collections, drawings and notes, and the use made of his data. *Journal and Proceedings of the Asiatic Society of Bengal (New Series)*, 29, 121–136.
- Hamilton, F. (1822) *An account of the fishes found in the river Ganges and its branches.* Archibald Constable, Edinburgh and Hurst, Robinson, London, 405 pp.
- Hora, S.L. (1923) Notes on fishes in the Indian Museum. V. On the composite genus *Glyptosternon*

- McClelland. *Records of the Indian Museum*, 25, 1–44.
- Hora, S.L. (1929) An aid to the study of Hamilton Buchanan's "Gangetic Fishes". *Memoirs of the Indian Museum*, 9, 169–192, Pls. 13–23.
- Hora, S.L. & Menon, M.A.S. (1949) Systematic position of three glyptosternoid fishes described by Hamilton. *Records of the Indian Museum* 46, 55–62.
- Jayaram, K.C. (1979) Aid to identification of siluroid fishes of India, Burma, Sri Lanka, Pakistan and Bangladesh. 3. Sisoridae. *Records of the Zoological Survey of India, Miscellaneous Publications, Occasional Paper*, 14, 1–62.
- Jayaram, K.C. & Singh, K.P. (1977) On a collection of fish from North Bengal. *Records of the Zoological Survey of India*, 72, 243–275.
- Menon, M.A.S. (1954) Notes on fishes of the genus *Glyptothorax* Blyth. *Records of the Indian Museum*, 52, 27–54.
- Misra, K.S. (1976) *The fauna of India and adjacent countries. Pisces. Vol. III. Teleostomi: Cypriniformes; Siluri*. Zoological Survey of India, Calcutta, 367 pp.
- Ng, H. H. & Lim, K.K.P. (1995) A revision of the Southeast Asian catfish genus *Parakysis* (Teleostei: Akysidae), with descriptions of two new species. *Ichthyological Exploration of Freshwaters*, 6, 255–266.
- Shaw, G.E. & Shebbeare, E.O. (1938) The fishes of northern Bengal. *Journal of the Royal Asiatic Society of Bengal, Science*, 3, 1–137.
- Steindachner, F. (1867) Ichthyologische Notizen (IV). *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften Wien. Mathematisch-Naturwissenschaftliche Klasse. Abteilung I, Mineralogie, Botanik, Zoologie, Anatomie, Geologie und Paläontologie*, 55, 517–534, Pls. 1–6.